A. BALLARD.

MEANS TO PREVENT TANKS FROM BURSTING BY FREEZING.

APPLICATION FILED APR. 24, 1909

931,112. Patented Aug. 17, 1909.

Fig. 1.

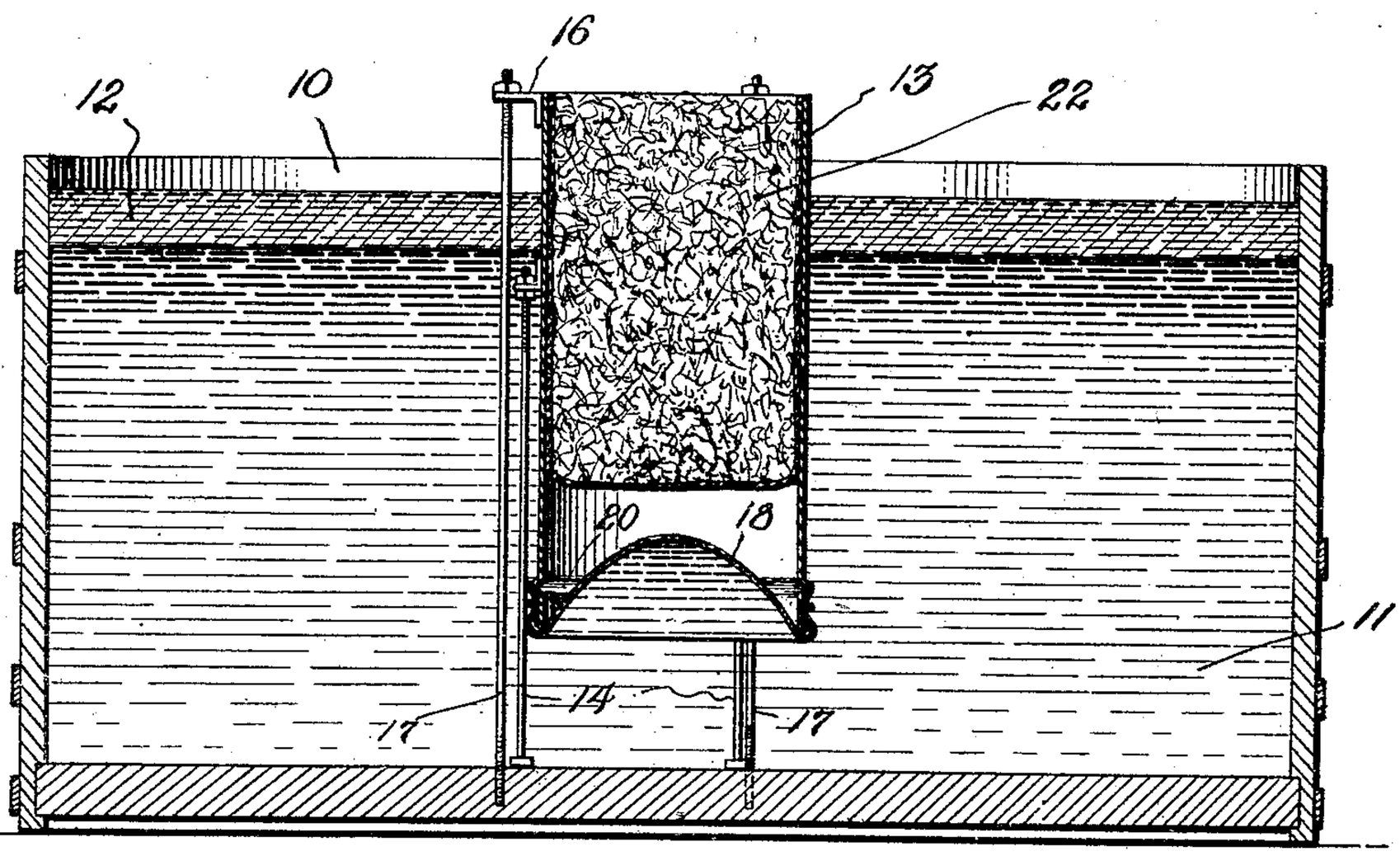


Fig. 2.

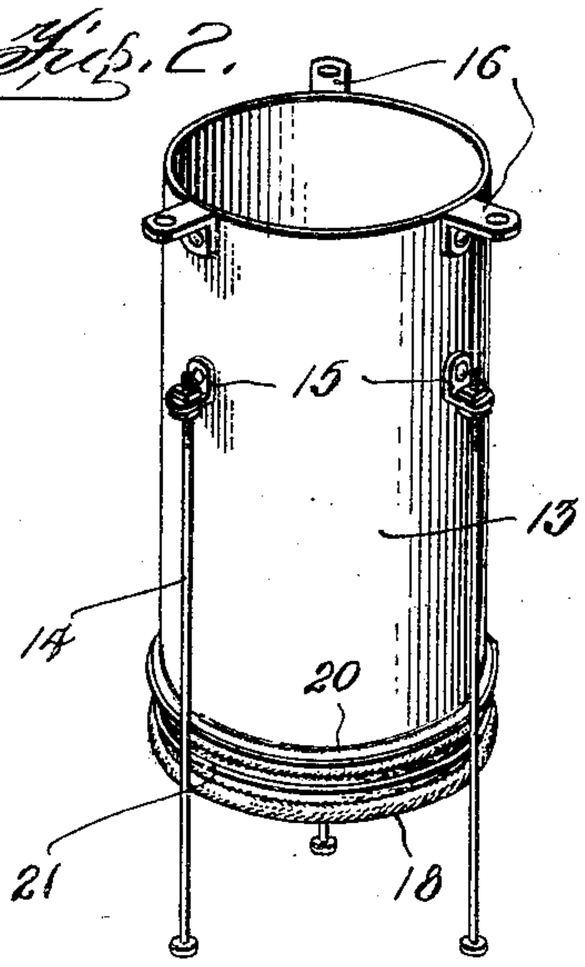
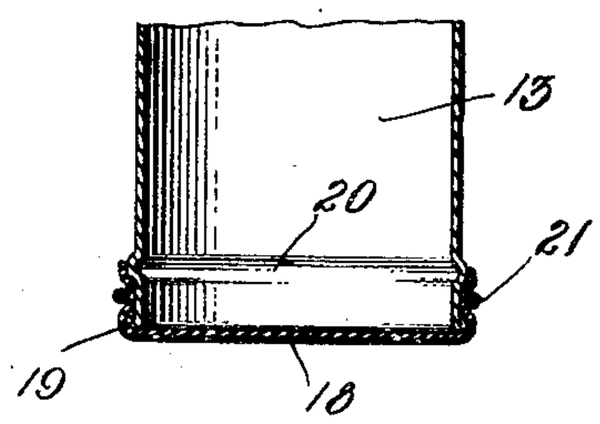


Fig. 3



Witnesses

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UNITED STATES PATENT OFFICE.

ALBERT BALLARD, OF DUNLAP, IOWA.

MEANS TO PREVENT TANKS FROM BURSTING BY FREEZING.

No. 931,112. Specification of Letters Patent. Patented Aug. 17, 1909.

Application filed April 24, 1909. Serial No. 491,936.

To all whom it may concern:

Be it known that I, ALBERT BALLARD, a citizen of the United States, residing at Dunlap, in the county of Harrison and State of Iowa, have invented certain new and useful Improvements in Means to Prevent Tanks from Bursting by Freezing, of which the following is a specification.

This invention relates to devices to prevent the enormous strain or pressure on the inner surfaces of water tanks or the like, due to freezing of the water contained therein, from bursting the same.

The invention consists in certain novel features of construction hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a vertical sectional view of the device indicating its mode of operation when ice has been formed within the tank; Fig. 2 is a perspective view of the tubular member described below and with certain parts attached thereto, and Fig. 3 is a fragmentary sectional view of the lower end of the tubular member showing the closure therefor in normal position.

Throughout the following detail description and on the several figures of the drawings similar parts are referred to by like reference characters.

Referring particularly to Fig. 1, 10 indicates a tank of any suitable size or construction, and shown as being filled with water 11 and ice 12. In order to relieve the pressure within the body of water within the lower portion of the tank which is well known to tend to cause rupture of the tank when ice forms at the top, I provide a tubular open ended member 13, of any suitable size or cross-sectional configuration. Said member is supported in any suitable manner within the tank and with its lower end extending downwardly into the body of water close to the bottom of the tank. Said supporting means are illustrated as comprising a set of legs 14 attached to the member 13 by means of ears or lugs 15. Other ears or lugs 16 coöperate with a number of lag bolts 17, whereby the member is fastened to the bottom of the tank.

The lower end of the member 13 is closed hermetically by means of a flexible, and preferably elastic, diaphragm 18 secured thereto in any suitable manner. As indicated the lower edge of the tube is rolled into a bead 19 and if desired a parallel crimp or bead 20 may be formed just above. The diaphragm 18 may be placed over said bead or beads and bound thereupon by means of a cord or wire 21. By this construction when the tube 13 is plunged into the tank of water the diaphragm will prevent the water rising therein except as would be incidental to the pressure due to the elevation of water only. When, however, the top of the tank becomes sealed by a layer of ice and internal pressure is set up the diaphragm is forced upward as indicated in Fig. 1 to relieve such pressure.

In order to prevent any likelihood of the water freezing in the region of the diaphragm and to otherwise protect the same from damage from outside obstacles it is preferable to close the mouth of the tube with suitable light and fibrous material, such as a bag of cotton, or the like, indicated at 22.

Having thus set forth a preferred embodiment of the invention but without desiring to be limited thereto except as required by the state of the art, what I claim as new is:—

1. In a device of the character set forth, the combination with a tank, of an upright tubular member, a set of legs connected to said tubular member whereby the same is spaced at its lower end a short distance from the bottom of the tank, a set of rods connected to said member holding the same downwardly toward the bottom of the tank in coöperation with said legs, a flexible diaphragm connected to and closing the lower end of said tubular member, and means to protect said diaphragm from damage from the outside thereof.

2. In a device of the character set forth, the combination with a tank, of a tubular open ended member therein, a flexible diaphragm secured to and closing the bottom of the member, means to maintain said member in position with its closed end close to the bottom of the tank, and a light fibrous packing for the interior of said member.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT BALLARD.

Witnesses:
J. R. WHEELER,
E. T. CHILD.